

Source Water Delineation and Assessment Report (SWDAR)

Bull River Campground United States Forest Service Public Water Supply

State of Montana Public Water Supply ID# 62357

Kootenai National Forest

Libby, MT 59923

Phone: 293-6211

System Location:

Northeast of Intersection of MT Highways 200 and 56
East Shore of Bull River Confluence with Cabinet Gorge Reservoir on Clark Fork River
Northwest of Noxon, Montana

System Contact: Cabinet District Ranger
2693 Hwy 200, Trout Creek, MT 59874
Telephone: 406-827-3533



October 2004

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1.0 INTRODUCTION

The Safe Drinking Water Act (SDWA) Amendments of 1996 require states to develop and implement Source Water Assessment Programs (SWAP) to analyze existing and potential threats to the quality of the public drinking water supplies throughout the state. The US Environmental Protection Agency (EPA) formally approved the Montana SWAP, prepared and administered by the Montana Department of Environmental Quality (MDEQ), in November 1999. The Montana SWAP was developed from the former Wellhead Protection Program, but includes surface water sources and requires a more rigorous inventory of potential contaminant sources.

SWAP addresses only public water systems (PWS) regulated according to the Federal Safe Drinking Water Act. A public water supply system is defined, according to Federal and Montana regulations, as a system that supplies water for human consumption. A public water supply system has at least 15 service connections or regularly provides water to at least 25 persons daily for a minimum of 60 days in a calendar year. There are three types of public water supply systems:

- Community water systems provide water on a year-round basis, and have a minimum of 15 service connections or regularly serve at least 25 residents. In addition to incorporated towns, community systems may serve smaller areas such as housing subdivisions or trailer courts.
- Non-transient non-community systems do not serve communities, but provide water regularly to a minimum of 25 of the same people for at least 6 months of a year. These systems serve public buildings such as schools and hospitals, where people are employed but do not reside.
- Transient non-community systems do not serve communities, and do not regularly serve a minimum of 25 of the same people for at least 6 months of the year. These systems are usually seasonal, and are located in areas such as campgrounds and parks. The Bull River Campground PWS is a transient non-community system.

The Montana Source Water Protection Program is intended to be a practical and cost-effective approach to help public drinking water supplies protect their water source from contamination. The United States Forest Service (USFS) works with the Montana DEQ to complete delineation and assessment reports for USFS managed public water supplies in Montana. The Source Water Delineation and Assessment Report (SWDAR) compiles the appropriate data and other technical information about an area to allow the USFS to develop source water protection plans for potable water supplies. Delineation is a process whereby areas that contribute water to aquifers or surface waters used for drinking water, called source water protection areas, are identified on a map. Geologic and hydrologic conditions are evaluated in order to delineate source water protection areas. Assessment involves identifying potential contaminant sources in delineated source water protection areas, and evaluating the potential for contamination of drinking water from these sources under "worst-case" conditions such as a flood, fire or human error.

Scope and Purpose

This report presents the source water delineation and assessments for the public water supply for the Bull River Campground located northwest of Noxon, in western Sanders County, Montana. This report is intended to meet the technical requirements for the completion of the delineation and assessment report for this PWS, as required by the Montana Source Water Protection Program (DEQ, 1999) and the federal Safe Drinking Water Act (SDWA) Amendments of 1996 (P.L. 104-182).

Acknowledgements

This report was prepared by James Swierc, hydrogeologist with the USFS Region 1 office, as part of a cooperative agreement with the United States Environmental Protection Agency. The Kootenai National Forest Engineer, Frank Votapka, provided information on well location and the inventory of potential contaminant sources.

Limitations

This report was prepared to assess threats to the Bull River Campground public water supply and is based on published information. The terms "drinking water supply" or "drinking water source" refer specifically to sources for regulated public water supplies, and not any other type of water supply. The inventory of potential contaminant sources focuses on the management areas delineated for the public water supply in this report. As a result, other potential sources of contamination to surface and ground water in the area may not be identified.

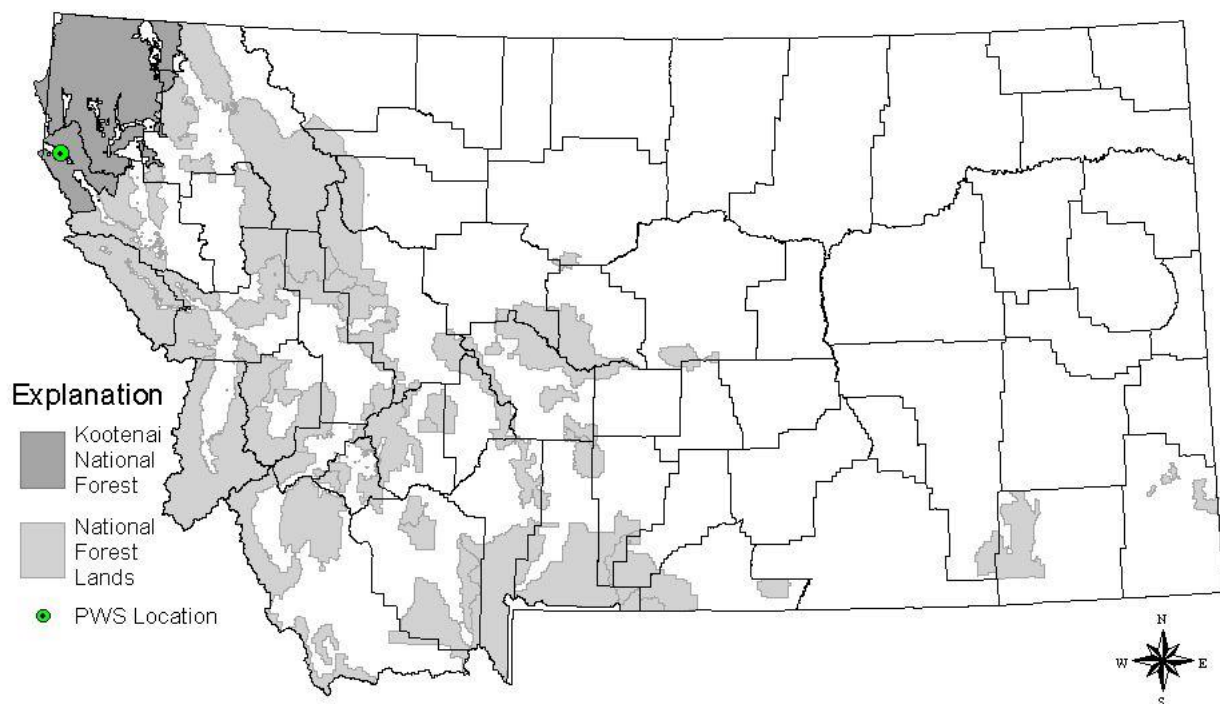


Figure 1 – Bull River Campground Location

2.0 BACKGROUND AND DELINEATION

The Bull River Campground is located within the Kootenai National Forest in Sanders County, approximately 4 miles northwest of Noxon. The largest towns in the area with commercial services are Thompson Falls, approximately 40 miles southeast, and Troy, approximately 35 miles north of the campground. The location of the PWS in the Kootenai National Forest is shown in Figure 1. The campground is situated on the east shore of the Bull River, immediately upstream from the confluence with Cabinet Gorge Reservoir. The campground is a transient, non-community public water supply. The Bull River Campground is located at approximately 48.03° North latitude and 115.84° West longitude, in Section 10 of Township 26 North, Range 33 West. The location of the campground is shown in Figure 2. The Bull River Campground well provides water for patrons of the campground. The sanitary survey for the system (Appendix A) indicates an estimated population of 2 residents and 26 other persons are served daily by the PWS with 11 service connections. The PWS is utilized during the summer months when the campground is open.

The public water supply uses one well (Source 002), installed to an approximate depth of 102 feet. Well information is summarized in Table 1. A well log with well construction information is included in Appendix A. According to the well log, the well was completed on October 17, 1996, and has static water level of 25 feet. The well has not been entered into the MBMG-GWIC database, as local queries did not yield this well present in the study area. There is no water right number listed for the well in DNRC files. Water is pumped from the well into a 1,500 gallon storage tank located near the well. Water flows by gravity to the distribution system in the campground south of the well (Figure 2). There is no treatment of the water prior to use.

Table 1. Source Well Information Summary.

Well	Well 1
Source ID	002
MBMG-GWIC ID#	--
DNRC Water Right	--
Location	48.0340°N Lat 115.8452°W Long T26N, R33W, Section 10 CCCA
Total Depth	102 feet
Completion Date	17 October 1996
Perforated Interval	Open Hole at Bottom of Casing
Static Water Level	25 feet
Pumping Water Level	43 feet
Pump Test Rate	60 gpm
Drawdown/Yield	18 ft / 3.33 gpm/ft

Hydrogeologic Assessment

The evaluation of the hydrogeology of the area is based predominantly on standard principles of hydrogeology. There are no readily available references specific to the hydrology of the Clark Fork River valley in this area. A generalized geologic map for the area is depicted in Figure 3. Ground water in the area near the Bull River Campground is present in an unconfined glacial aquifer interpreted to be present proximal to the Bull River as it enters the Clark Fork River valley. The aquifer is bounded by bedrock present near the surface along the margins of the valley. Recent alluvium fills the majority of the floodplain overlying glacial strata which fills the valley base and continues to cover the bedrock on the margins of the valley. According to the well log for the PWS well, the aquifer is a sand and gravel seam at a depth of 80 feet. This facies is interpreted to be glacio-fluvial deltaic sediments deposited into Glacial Lake Missoula, from the valley for the Bull River. The aquifer is covered by 35 feet of fine sand, characteristic of Glacial Lake Missoula sediments. Ground water flow in the aquifer is interpreted to generally follow the topographic gradient of the Bull River towards the central part of the valley. Recharge to the well for the Bull River Campground PWS is interpreted to occur from stream loss from the Bull River upstream from the campground, and along the margins of the valley, where bedrock is exposed against aquifer material. Based on the hydrogeologic setting, the Bull River Campground water source is an unconfined aquifer in unconsolidated glacial sediments, which is considered to have a **high** source water sensitivity to contamination according to the Montana SWAP Program (DEQ, 1999).

Source Water Protection Management Zones

The source water protection areas for the Bull River Campground PWS are identified based on the criteria for a transient non-community PWS as defined in the Montana SWAP Program (DEQ, 1999). For the PWS source, two primary management areas are identified within the source water protection area; the control zone and the inventory region. The control zone, also known as the exclusion zone, is an area at least 100-foot radius around the well. The inventory region for the well is delineated as the area within a one mile radius around the well. The inventory zone for the well and the surrounding area is depicted in Figure 4.

Since the aquifer may be in connection with surface water in the Bull River (see Susceptibility Assessment for further information), a surface water buffer zone comprising a buffer of ½ mile around the Bull River upstream from the PWS is delineated. The surface water buffer zone is shown in Figure 4.

Bull River Campground Sampling Results and Water Quality

Every PWS is required to perform monitoring for contamination to their water supply. The monitoring parameters for transient non-community systems typically include coliforms (as an indicator of pathogenic organisms), and nitrates as an acute health risk. A review of DEQ and USFS databases of monitoring results for the Bull River Campground PWS (Appendix A) indicates no problems associated with any sampling. The detected level of nitrates has been consistently less than the drinking water standard of 10 mg/L.

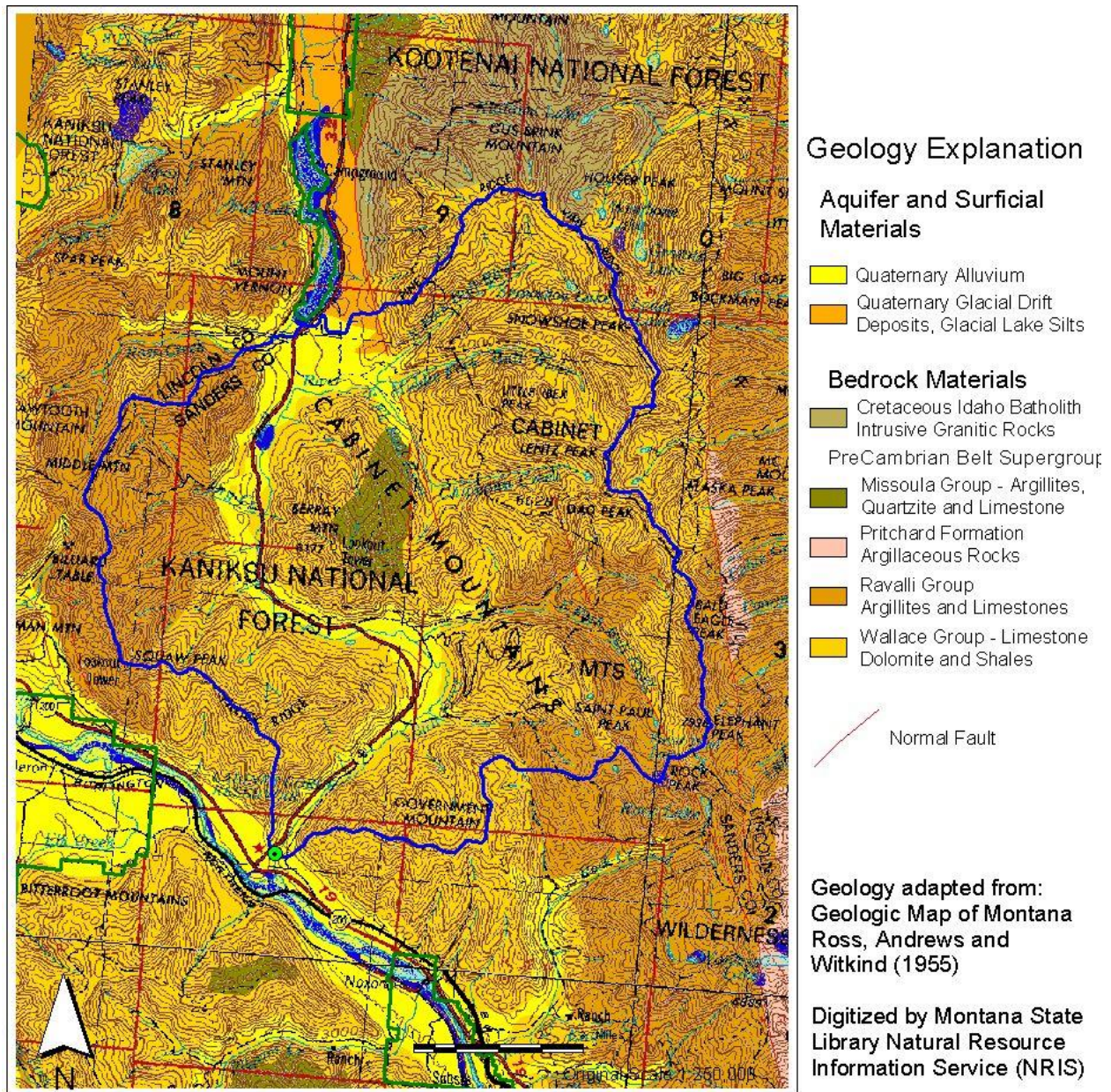


Figure 3 – Bull River Campground Area Geology

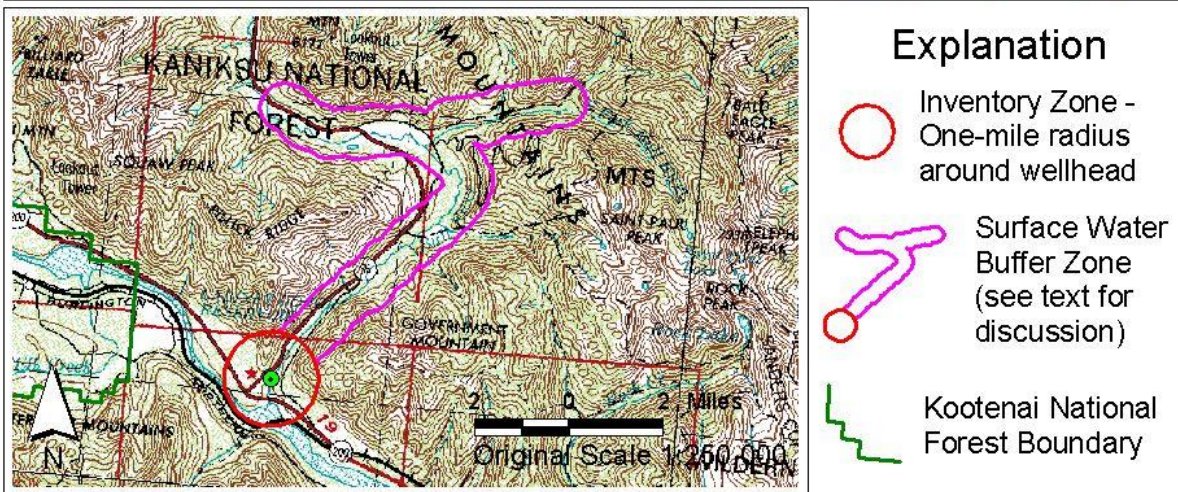
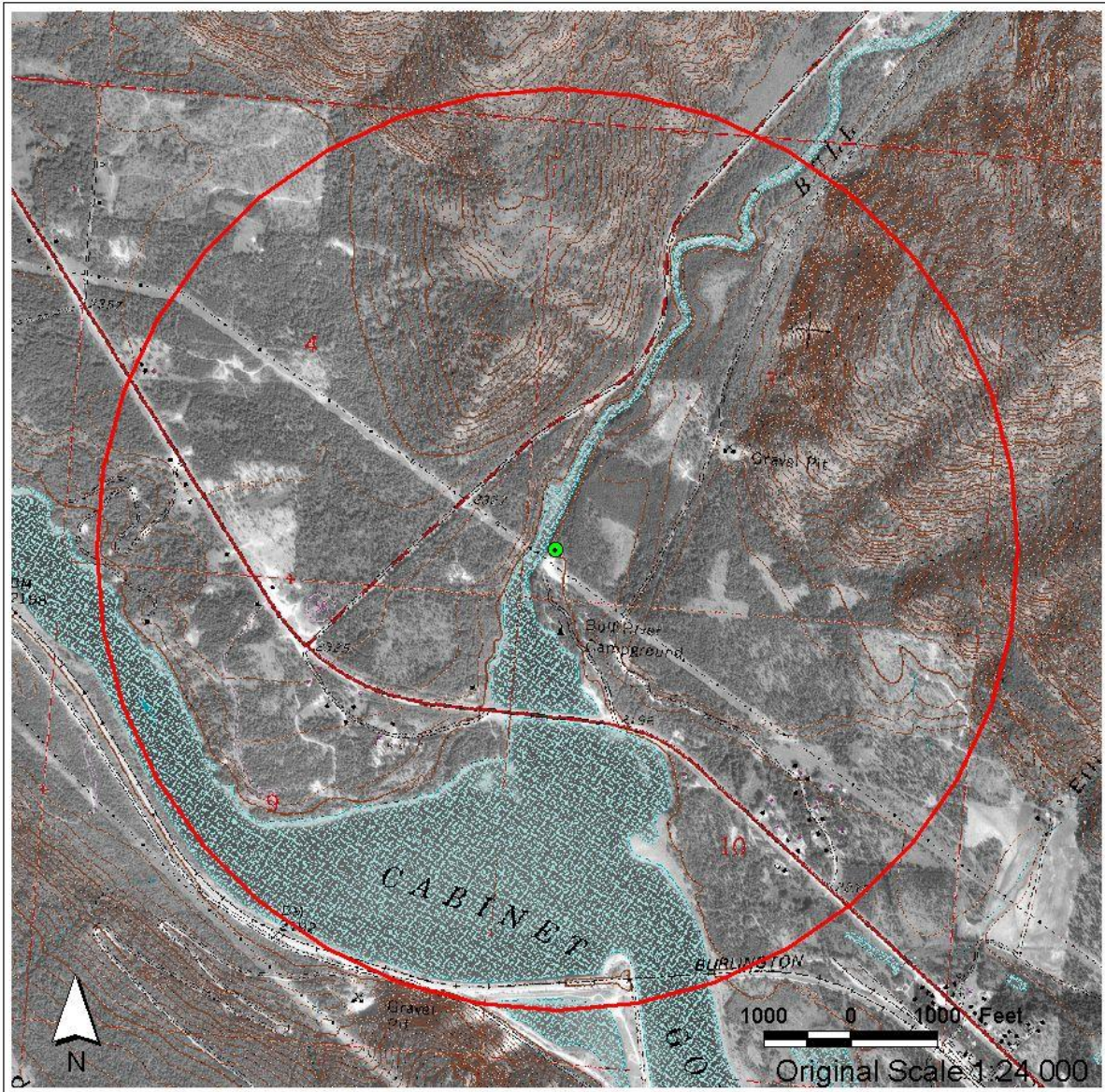


Figure 4 – Bull River Campground Source Water Management Zones

3.0 INVENTORY

An inventory of potential sources of acute health hazards was conducted for the Bull River Campground PWS source within the control and inventory zones. The contaminants in this category represent nitrates and pathogens, as required by the Montana Source Water Protection Program (DEQ, 1999). Potential sources include areas with septic systems and agricultural areas where nitrogen fertilizers may be used. Land use for the area is shown in Figure 5. While additional sources of contamination may be present, this assessment only focuses on the above listed potential contaminants.

Inventory Results/Control Zone

The control zone represents the most critical point to protecting the integrity of a wellhead for ground water sources. The control zone around the wellhead is not fenced or otherwise protected from access.

Inventory Results/Inventory Region

The inventory region represents the area near the source well where any contamination spilled onto the ground or subsurface has the potential to migrate directly into the PWS source aquifer. The toilets for the Bull River Campground, the access road to the campground, and MT Highway 56 and Highway 200 are present within the inventory zone. Land use within the inventory region is classified primarily as non-agricultural and non-urban, with forested lands as shown in Figure 5. Additionally, there are a small subdivision southwest of the campground and a commercial gas station west of the campground, both on the west side of the Bull River. These septic systems represent a moderate hazard density, as shown in Figure 6.

Inventory Results/Surface Water Buffer Zone and Watershed Regions

Land use within the surface water buffer zone and watershed region is classified as non-agricultural and non-urban.

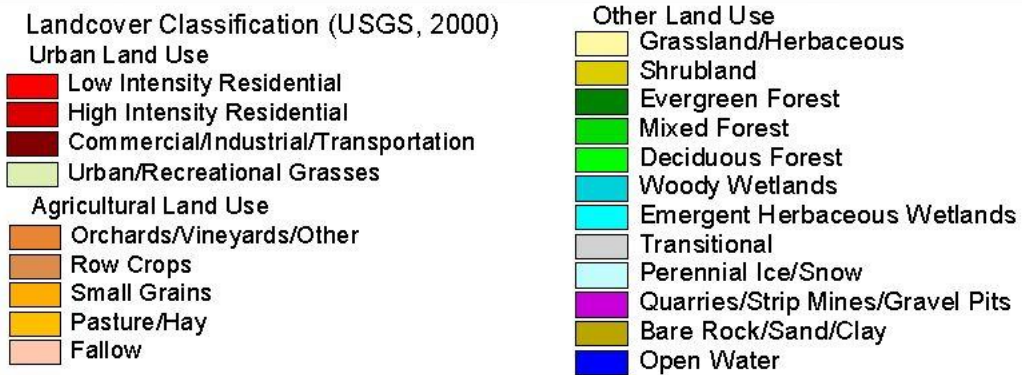
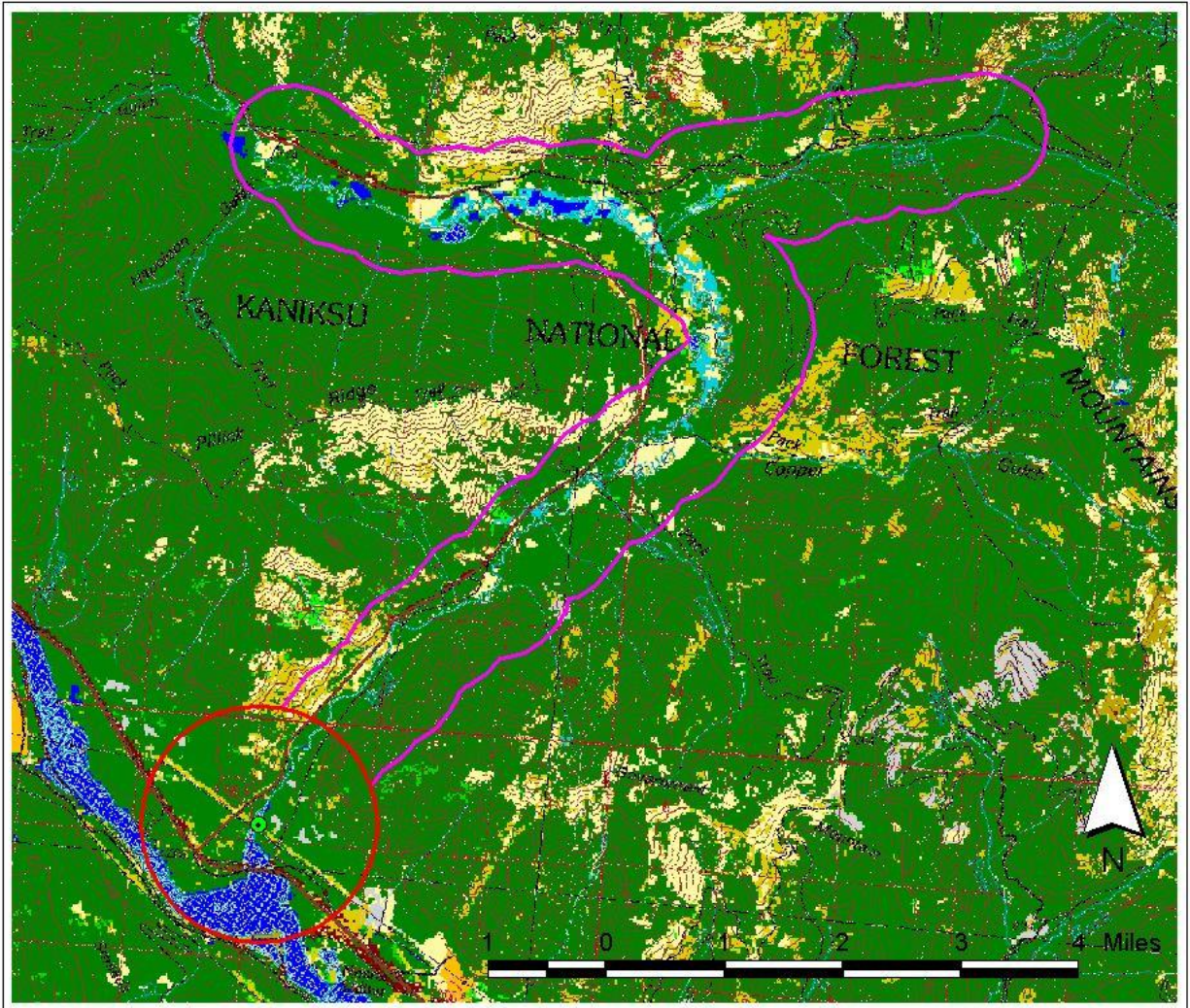


Figure 5 – Bull River Campground Watershed Area Land Cover Classification

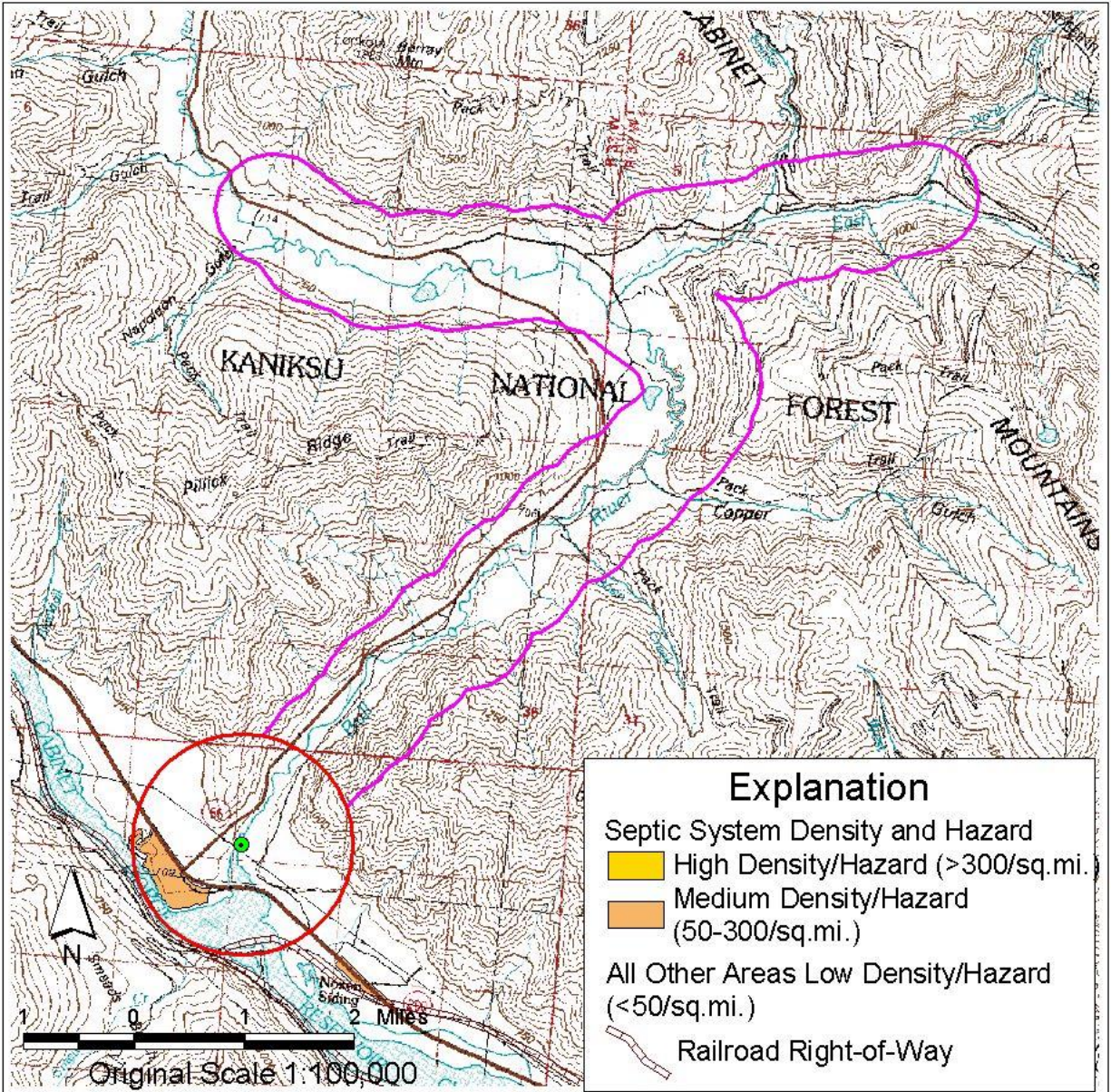


Figure 6 – Bull River Campground Septic System Density

4.0 SUSCEPTIBILITY ASSESSMENT

Susceptibility is the potential for a public water supply to draw water contaminated by inventoried sources at concentrations that would pose concern. Susceptibility is assessed in order to prioritize potential pollutant sources for management actions by the Kootenai National Forest, in this case the Bull River Campground PWS.

The goal of Source Water Management is to protect the source water by controlling activities in the control zones and managing significant potential contaminant sources in the Inventory Regions. Management priorities in the Inventory Region are determined by ranking the significant potential contaminant sources identified in the previous chapter according to susceptibility. Alternative management approaches that could be pursued by the Kootenai National Forest for the Bull River Campground PWS to reduce susceptibility are recommended.

Susceptibility is determined by considering the hazard rating for each potential contaminant source and the existence of barriers that decrease the likelihood that contaminated water will flow to the Bull River Campground PWS source. Hazards are assigned based on the percent of land in the inventory zone for non-point sources, and the location for point sources. Susceptibility ratings are presented individually for each potential contaminant source.

After the relative hazard of a potential contaminant source is assigned, the relative susceptibility is determined based on the presence of barriers that may mitigate the potential for a contaminant source to impact a water source. Barriers may represent natural conditions, engineered barriers or management actions. Natural barriers include anything that can be demonstrated as effective in slowing the migration of any chemicals released at the surface. Engineered barriers represent man-made structures to contain chemicals if they are released. Management barriers are plans that prohibit or control potentially polluting activities, but only if there is a plan or approach that has been formally implemented. For the Bull River Campground PWS source, a management barrier is noted for the vault toilets, representing the proper maintenance of the facilities.

Susceptibility Assessment Results

The results of the susceptibility assessment for the Bull River Campground PWS are listed in Table 2. The primary threats identified are the vault toilets, the access road and the nearby highways, the subdivision septic tanks and the gas station. The summary information in Table 1 reviews the relative hazard, barriers and susceptibility ranking of each potential source. Management alternatives are recommended that can help reduce the relative susceptibility of each identified potential contaminant source to the PWS sources.

Table 2. Susceptibility assessment of significant potential contaminant sources.

Source	Contaminant	Hazard	Hazard Rating	Barriers	Susceptibility	Management
Control Zone						
No sites identified						
Inventory Zone						
Vault Toilet	Nitrates and Pathogens	Infiltration and Runoff	High	Management	High	Maintain proper operation and maintenance protocols
Campground Access Road, MT Highways 56 and 200	Various Chemicals	Spills	High	None	Very High	Develop emergency response plan
Septic Systems	Nitrates and Pathogens	Infiltration, and Runoff	High	None	Very High	Develop emergency response plan
Commercial Gas Station	Various Chemicals	Spills	High	None	Very High	Develop emergency response plan

5.0 REFERENCES

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